International Journal of Aquatic Science
ISSN: 2008-8019
Vol 13, Issue 01, 2022

Google Assistant based Device Control

Akshata Kamble[1], A. O. Mulani[2]

[1,2]*PG Student, SKN Sinhgad College of Engineering, Pandharpur*

Abstract: This research works presents the development of a smart home using Google Assistant. The idea behind this is to control home devices with voice. In the market there are many devices available to do that. But making your own is awesome. Proposed system built personal assistant that will do the work according to command. The assistant requires voice commands. In this proposed work, single board computer i.e. Raspberry pi is used which is linked to IFTTT website. Then voice commands are added for Google assistant. In this home appliances like Bulb, cooling fan, and motor are used which can be controlled easily using Google assistant from the voice control. In this system Google assistant is installed in raspberry pi and Raspberry pi is attached with a mic which takes all the voice commands through which it will automatically control the home appliances. As the user gives the voice command to the mic, according to that the home appliances can be switched ON/OFF accordingly.

Keyword: Google Assistant, Smart Home, Device control, Raspberry pi.

1. INTRODUCTION

Home automation system can be referred as a system which replaces human interactions by controls. Devices uses internet to connect to each other and operate further. Internet of Thing is a dust that turns the automated home into the smart home. Internet of thing allows object to be controlled and sensed. Home automation is used for connecting various electrical devices in our home or office. These automation systems are designed or manufactured according to need of customer. Using home automation we can control devices remotely i.e. we can control lights, A.C, room temperature etc. Home automation systems are used for power saving. Home automation system requires computers which are large as well as heavy to carry around.
The major part of automation which supports to IoT is that the Raspberry Pi. The Raspberry Pi collects information from sensors or takes in speech or gesture commands IoT is the combination of two words: the internet and things. The internet suggests that connectivity, a factor cover not solely electronic devices however additionally includes living things and non-living things and therefore the word "of" connect these two words to make an IoT. Due to its diversification, it is necessary to grasp what IoT is, defines IoT as "An open and comprehensive network of intelligent objects that have the capability to auto-organize, share info, data, and resources, reacting and acting in face of things and changes within the environment" and interprets them to manage household devices like fan, light, heater, door, and opening and shutting of curtains. For example, if there's no presence of a automatically turned off for that specific room.
In recent years, wireless systems like Wi-Fi have become more and more common in home networking. In home and building automation systems, the use of wireless technologies gives several advantages that could not be achieved using only a wired network.

2. LITERATURE SURVEY:

In Bluetooth based home automation system the home appliances are connected to the Arduino BT board at input output ports using relay. The program of Arduino BT board is based on high level interactive C language of microcontrollers; the connection is made via Bluetooth. The password protection is provided so only authorized user is allowed to access the appliances. The Bluetooth connection is established between Arduino BT board and phone for wireless communication. In this system the python script is used and it can install on any of the Symbian OS environment, it is portable. One circuit is designed and implemented for receiving the feedback from the phone, which indicate the status of the device
To monitor and control the home appliances the system is designed and implemented using Zigbee. The device performance is record and store by network coordinators. or this the Wi-Fi network is used, which uses the four switch port standard wireless ADSL modern router. The network SSID and security Wi-Fi parameter are preconfigured. The message for security purpose first process by the virtual home algorithm and when it is declared safe it is re-encrypted and forward to the real network device of the home. Over Zigbee network, Zigbee controller sent messages to the end. The safety and security of all messages that are received by the virtual home algorithm. To reduce the expense of the system and the intrusiveness of respective installation of the system Zigbee communication is helpful. [1]
Because of the mobile phone and GSM technology, the GSM based home automation is lure to research. The SMS based home automation, GPRS based home automation and dual tone multi frequency (DTMF) based home automation, these options we considered mainly for communication in GSM. In figure shows the logical diagram the work of A. Alheraish, it shows how the home sensors and devices interact with the home network and communicates through GSM and SIM (subscriber identity module). The system use transducer which convert machine function into electrical signals which goes into microcontroller. The sensors of system convert the physical qualities like sound, temperature and humidity into some other quantity like voltage. The microcontroller analysis all signal and convert them into command to understand by GSM module. Select appropriate communication method among SMS, GPRS and DTFC based on the command which received GSM module.[1]

Wi-Fi based home automation system mainly consist three modules, the server, the hardware interface module, and the software package. The figure shows the system model layout. Wi-Fi technology is used by server, and hardware Interface module to communicate with each other. The same technology uses to login to the server web based application. The server is connected to the internet, so remote users can access server web based application through the internet using compatible web browser. Software of the latest home automation system is split to server application software, and Microcontroller (Arduino) firmware. The Arduino software, built using C language, using IDE comes with the microcontroller itself. Arduino software is culpable for gathering events from connected sensors, then applies action to actuators and pre-programed in the server. Another job is to report the and record the history in the server DB. The server application software package for the proposed home automation system, is a web based application built using asp.net. The server application software can be accessed from internal network or from internet if the server has real IP on the internet using any internet navigator supports asp.net technology. Server application software is culpable of, maintain the whole home automation system, setup, configuration. Server use database to keep log of home automation system components, we choose to use XML files to save system log [1]

3. PROPOSED SYSTEM:

The whole project circuit diagram is shown in Figure 1. Power supply of external hardware is provided through Raspberry pi board. In this figure, red line shows the positive power supply and black line shows the negative (Ground) pin. The positive and negative supply is extracted from Raspberry pi board. Two raspberry pi GPIO 4 and 17 are used. The two GPIO pins which are marked as GREEN and BLUE are connected to external circuit. The output pins of Relay is connected to external electrical device. The Common pin is connected to Phase connection of AC Supply. The NO (Normally Open) pin is connected to AC supply through Series connection of FAN (Light or any other electrical appliance).
Thus when a GPIO pin is turn on/off the relay actives. According to relay status the AC circuit path breaks or establish and electrical appliance turns on/off.

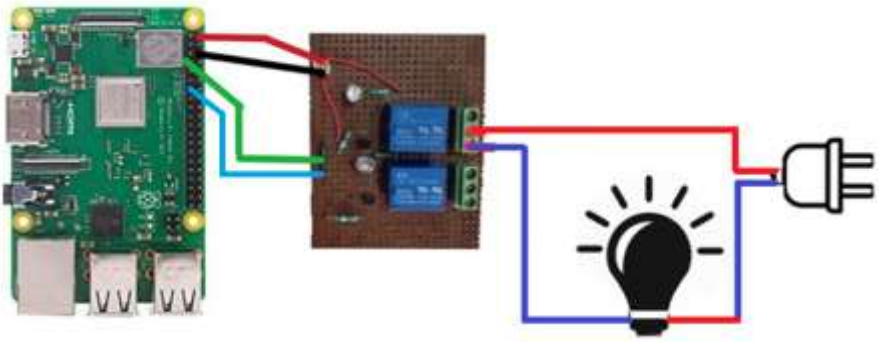

Figure 1. Proposed method

3.1. Component list:

Following are the components required for the proposed system:

1. 5V Relay
2. BC547 Transistor
3. Jumper cables (female to female)
4. 10KOhm resistor
5. 100 Ohm Resistor
6. 3 Pin Screw Terminal
7. Male Berg Strip
8. LED(optional)
9. PCB Prototype Board
10. Electrical wires in at least 2 colours
11. Wire Cutters
12. Wire Strippers
13. Screwdriver

3.2. Flowchart:

Figure 2 shows flowchart of the proposed system.

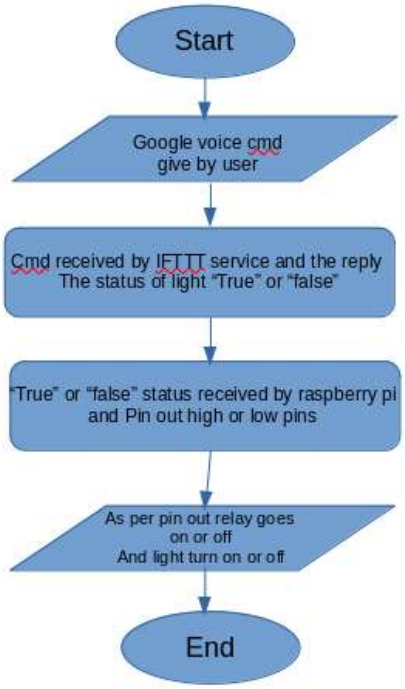

Figure 2. Flowchart of the proposed system

4. CONCLUSION

Based on all the systems surveyed and their advantages and drawbacks, this report presents the features to be possessed by an ideal system for home automation with remote access. An ideal system should be available from all over the world to a user and in real time. A internet network is identified as a candidate for this. However. Only the Internet can ensure that access can be made available at all times. This will give rise to a standard access method for the home appliances using the Internet protocol. The user interface should be a web application that has an associated mobile application. So that people of all kinds can access the system. Such a system should also have the feature of being easy to install. Only then can automated homes become commercially viable. There should be a lot of thought put into the design of the user interface for these apps. Plug and play capabilities will be an added bonus for the system. Ease of adding a new device to an automated house will play an important role in taking forward the systems commercially.

5. REFERENCE

[1] Adnya Adhiya, Shriya Ghuge, H.D Gadade, "A survey on home automation system using IOT" IJRITCC Volume_5_Issues-March_17_Volume_5_Issue_3

[2] Kim Baraka, Marc Ghobril, Sami Malek, RouwaidaKanj, AymanKayssi "Low cost Arduino/Android-based Energy-Efficient Home Automation System with Smart Task Scheduling", 2013 Fifth International Conference on Computational Intelligence, Communication Systems and Networks.

[3] HayetLamine and Hafedh Abid," Remote control of a domestic equipment from an Android application based on Raspberry pi card", IEEE transaction 15th international conference on Sciences and Techniques of Automatic control & computer engineering - STA'2014, Hammamet, Tunisia, December 21-23, 2014

[4] YunCui, MyoungjinKim, YiGu, Jong-jinJung, and HankuLee, "Home Appliance Management System for Monitoring Digitized Devices Using Cloud Computing Technology in Ubiquitous Sensor Network Environment",Hindawi Publishing Corporation International Journal of Distributed Sensor Networks Volume 2014, Article ID 174097
[5] Shih-Pang Tseng, Bo-Rong Li, Jun-Long Pan, and ChiaJuLin,"An Application of Internet of Things with Motion Sensing on Smart House", 978-1-4799-6284-6/14©2014 IEEE.
[6] Mane, P. B., Mulani, A. O. High speed area efficient FPGA implementation of AES algorithm. (2018) International Journal of Reconfigurable and Embedded Systems (IJRES), 7 (3), pp. 157-165.
[7] A.O.Mulani and Dr.P.B.Mane, "Watermarking and Cryptography Based Image Authentication on Reconfigurable Platform", Bulletin of Electrical Engineering and Informatics, Vol.6 No.2, pp 181- 187,2017
[8] Kulkarni P.R., Mulani A.O. and Mane P. B., "Robust Invisible Watermarking for Image Authentication", In Emerging Trends in Electrical, Communications and Information Technologies, Lecture Notes in Electrical Engineering, vol. 394,pp. 193-200, Springer, Singapore, 2017.
[9] A.O.Mulani and Dr.P.B.Mane, "An Efficient implementation of DWT for image compression on reconfigurable platform", International Journal of Control Theory and Applications, Vol.10 No.15, 2017.
[10] Amruta Mandwale and A. O. Mulani, "Different Approaches For Implementation of Viterbi decoder", IEEE International Conference on Pervasive Computing (ICPC), Jan. 2015.
[11] Ganesh Shinde and Altaf Mulani, "A Robust Digital Image Watermarking using DWT-PCA", International Journal of Innovations in Engineering Research and Technology (IJIERT), Vol. 6 Issue 4 April 2019.
[12] A.O.Mulani and Dr.P.B.Mane, "Area Efficient High Speed FPGA Based Invisible Watermarking for Image Authentication", Indian Journal of Science and Technology, Vol.9. No.39, Oct. 2016. ISSN 0974-5645
[13] S. S. Swami and A. O. Mulani, "An efficient FPGA implementation of Discrete Wavelet Transform for image compression", International Conference on Energy, Communication, Data Analytics and Soft Computing (ICECDS),2017
[14] Rahul G. Ghodake and A. O. Mulani, "Sensor Based Automatic Drip Irrigation System", Journal for Research, 2016.
[15] Renuka Kondekar and A. O. Mulani, "Raspberry pi based voice operated Robot", International Journal of Recent Engineering Research and Development (IJRERD), Vol. 2 Issue 12, Dec. 2017.
[16] A. O. Mulani and G. N. Shinde, "An approach for robust digital image watermarking using DWT- PCA", Journal ofScience and Technology, Vol.6, Special Issue 1, 2021
[17] DOI: https://doi.org/10.46243/jst.2021.v6.i04.pp59-62
[18] U. P. Nagane and A. O. Mulani, "Moving Object Detection and Tracking Using Matlab", Journal of Science and Technology, Vol.6, Special Issue 1, 2021 DOI: https://doi.org/10.46243/jst.2021.v6.i04.pp63-66
[19] Pratima Amol Kalyankar, Altaf O. Mulani, Sampada P. Thigale, Pranali Gajanan Chavhan and Makarand M. Jadhav, "Scalable face image retrieval using AESC technique", Journal Of Algebraic Statistics Volume 13, No. 3, p. 173 – 176, 2022
[20] A.O.Mulani, M. M. Jadhav and Mahesh Seth, "Painless Non-invasive blood glucose concentration level estimation using PCA and machine learning" in the CRC Book

entitled Artificial Intelligence, Internet of Things (IoT) and Smart Materials for Energy Applications, 2022

[21] Rahul S. Pol, Amar B. Deshmukh, Makarand M. Jadhav, Kazi Kutubuddin Sayyad Liyakat, Altaf O. Mulani, "Ibutton Based Physical Access Authorization And Security System", Journal Of Algebraic Statistics Volume 13, No. 3, p. 3822 – 3829, 2022

[22] Kazi Kutubuddin Sayyad Liyakat, Nilima S Warhade, Rahul S Pol, Hemlata M Jadhav, Altaf O Mulani, "Yarn Quality detection for Textile Industries using Image Processing", Journal Of Algebraic Statistics, Volume 13, No. 3, p. 3465 – 3472, 2022

[23] Jadhav M. M., G. H. Chavan and A. O. Mulani, "Machine Learning based Autonomous Fire Combat Turret", Turkish Journal of Computer and Mathematics Education (TURCOMAT), 12(2), 2372-2381, 2021

[24] Supriya D. Kolekar, Vaishali B. Walekar, Priyanka S. Patil, A. O. Mulani, A. D. Harale, "Password Based Door Lock System", International Journal of Aquatic Science, Vol 13, Issue 01, 2022

[25] Atik N. Pathan, Suraj A. Shejal, Shubham A. Salgar , A.D. Harale, A. O. Mulani, "Hand Gesture Controlled Robotic System", International Journal of Aquatic Science, Vol 13, Issue 01, 2022

[26] V. B. Utpat, K. J. Karande and A. O. Mulani, "Grading of Pomegranate Using Quality Analysis", International Journal for Research in Applied Science & Engineering Technology (IJRASET), Volume 10, Issue II, Feb-2022.

[27] Swapnil Takale, Dr. Altaaf Mulani, "Video Watermarking System", International Journal for Research in Applied Science & Engineering Technology (IJRASET), Volume 10, Issue III, Mar-2022.

[28] Priyanka Kulkarni and A. O. Mulani, "Robust Invisible Digital Image Watermarking using Discrete Wavelet Transform", International Journal of Engineering Research & Technology (IJERT), Vol. 4 Issue01, pp.139-141, Jan.2015

[29] Ghodake RG, Mulani AO (2016) Microcontroller Based Automatic Drip Irrigation System. In: Techno-societal 2016, international conference on advanced technologies for societal applications, pp. 109–115. Cham: Springer, Cham

[30] A. O. Mulani and P. B. Mane, "Area optimization of cryptographic algorithm on less dense reconfigurable platform,"2014 International Conference on Smart Structures and Systems (ICSSS), Chennai, 2014, pp. 86-89

[31] Kim Baraka, Marc Ghobril, Sami Malek, RouwaidaKanj, AymanKayssi," Smart Power Management System For Home Appliances And Wellness Based On Wireless Sensors Network And Mobile Technology", ,2015 XVIII AISEM Annual Conference, 978-1-4799-8591-3/15©2015 IEEE

[32] Shiu Kumar, "Ubiquitous Smart Home System Using Android Application", International Journal of Computer Networks & Communications (IJCNC) Vol.6, No.1, January 2014.

[33] Jan Gebhardt, Michael Massoth, Stefan Weber and TorstenWiens, "Ubiquitous Smart Home Controlling Raspberry Embedded System", UBICOMM: The Eighth International Co nference on Mobile Ubiquitous Computing, Systems, Services and Technologies, 2014.